Quiz 7

1. (4 points) Let $S = \{1, 2, 3\}$. Write down a subset of $S \times S$ which determines a relation on S that is:
   a. Symmetric but not transitive and not reflexive.

   b. Symmetric and transitive but not reflexive.

2. (6 points) Let $S = \{(a, b) \mid a, b \in Z \text{ and } a, b \neq 0\}$. Decide if each of the following relations is an equivalence relation on S. Prove that your answer is correct.
   a. $(a, b) \sim (c, d)$ iff $a - c = b - d$.

   b. $(a, b) \sim (c, d)$ iff $a + c = b + d$